# Verification, Validation and Accreditation
# of
# Models and Simulations

**ORSA CEP 03-702**
**MAXWELL AFB, 19-21 November 2002**

**The benefits of applying simulation modeling and analysis are well known. But in order to secure and realize those benefits, there is an urgent need in the military and government agencies to minimize the risk of making decisions based on inappropriate or flawed simulations. This workshop satisfies that need by providing a practical and useful methodology to assure that simulations are appropriate representations of the real-world systems being modeled. The methodology goes beyond the verification and validation (V&V) techniques employed for general software products. It addresses the needs for accreditation or certification of models and simulations for particular applications. As such, the specific goals are to:**

- **Highlight key points concerned with establishing a model's credibility,**
- **Make model and simulation assessment less a "matter-of-faith" and more the result of a well-founded process,**
- **Provide a practical, systematic and procedural road map,**
- **Harmonize VV&A methodologies with current DOD and service directives, instructions, and master plans, and**
- **Establish the credibility of simulations used to support decisions, thus increasing confidence in those decisions.**

**This workshop is very practical. It is based on the instructor's past experiences in managing and conducting the assessment of over 10 large-scale models and simulations. The methodology and activities are motivated through the extensive use of case studies and group activities. A hands-on computer laboratory is available. It is devoted to the application of experimental design procedures in the validation of simulations.**

**This workshop is aimed at managers and practitioners - an audience that includes model and simulation users, systems and software engineers, model and simulation developers and product integrity specialists**

**TEXTS: Participants will receive copies of the texts: Simulation Validation: A Confidence Assessment Methodology, VV&A Reference Guide as well as a bound Participant's Guide.**

**BIOGRAPHY: Peter L. Knepell, Ph.D., is president of Peak Quality Services in Colorado Springs, CO. He has experience in computer-based prediction models, intelligent systems technology, and Six Sigma tools and techniques. He is particularly interested in improving processes involving development of software, application of simulation tools, automation of factories, and growth of employee skills. His past clients include: Ballistic Missile Defense Organization (formerly, SDIO), Army Material Systems Analysis Activity (AMSAA), Army Concepts Analysis Agency (CAA), Air Force Studies and Analysis Agency (AFSAA), Army Test and Evaluation Command (ATEC), the Defense Special Weapons Agency (DSWA, formerly DNA), Air Force Phillips Laboratory, the Defense Modeling & Simulation Office (DMSO), Amgen, Johnson & Johnson, General Electric, Sony and Corning.**

**The practical aspects of this workshop are based on Dr. Knepell's experience working with many different simulations. For example, he worked for the National Test Bed (NTB), a program established to support simulations and experiments for the Strategic Defense Initiative (SDI). While there, he directed the NTB's first study of system design alternatives using a large-scale, event-driven simulation. He applied experimental design techniques to minimize the number of simulation runs needed to complete the analysis and graphically display the results -- specifically, the number of runs was reduced from over 40,000 to less than 100. This is documented as a case study in the text, *Understanding Industrial Designed Experiments*. Dr. Knepell also co-authored the book, *Simulation Validation: A Confidence Assessment Methodology.***

**A graduate of the US Air Force Academy, he received his doctorate degree in Operations Research from Cornell University. As a tenured professor at the Air Force Academy, he used simulations to inspire innovative thinking and group problem solving. Dr. Knepell is currently an adjunct professor with the George Washington University and Colorado Technical University. The American Society recognizes him as a Certified Quality Engineer (CQE) and Certified Software Quality Engineer (CSQE) for Quality.**

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**ELIGIBILITY: Military Officers who possess OPMS Functional Area 49 (ORSA) and civilian GS-1515 analysts. A graduate degree in ORSA or ORSA-related field is preferred. This is a special offering for Maxwell Air Force Base personnel.**

**APPLICATION: Personnel desiring to attend should apply via their Training Officer through the Army Training Requirements and Resources System (ATRRS), Course Code ALMC-SE 03-702.**

**POINT OF CONTACT: Point of Contact at Maxwell AFB can be reached at DSN 493-6698.**

**PLACE: Room B8/B9, Bldg. 1406, Air Force War Gaming Institute, Maxwell AFB.**

**CLASSIFICATION: The course is unclassified.**

**FUNDING: Travel and TDY payments for any personnel accepted into the course must be paid by the attendee's parent organization.**

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**POINT OF CONTACT: Further information may be obtained from the ORSA CEP course director at DSN 539-4249/4226, commercial (804) 765-4249/4226 or e-mail orsacep@lee.army.mil**